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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**
Washington, DC 20004-2901



June 18, 2012

The Honorable Thomas P. D'Agostino
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Mr. D'Agostino:

The Defense Nuclear Facilities Safety Board (Board) has reviewed the approved safety basis for the Plutonium Facility (PF-4) at Los Alamos National Laboratory (LANL) and concludes that for one accident the mitigated dose consequences to the public exceed 100 rem total effective dose equivalent (TEDE), which would require additional safety controls for the facility. The Board's analysis differs from Revision 1 of the 2011 Documented Safety Analysis (DSA) by LANL that presents a mitigated offsite dose of 23 rem TEDE. A detailed review by the Board's staff identified a number of deficiencies in the technical basis that supports the 2011 DSA, including concerns with the quality review process for documents and analyses. The enclosed report provides the results of the staff's review.

The Board issued Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, on October 26, 2009, to address the potential consequences associated with seismically-induced events at PF-4 and requested that the Department of Energy develop and implement an acceptable seismic safety strategy. The mitigated consequences associated with the seismically-induced fire scenario were two orders of magnitude higher than the Department of Energy evaluation guideline of 25 rem TEDE. Subsequently, the National Nuclear Security Administration (NNSA) and LANL personnel implemented near-term compensatory measures to reduce seismic risk, identified and implemented new safety controls, completed a series of physical upgrades to the PF-4 building structure, and developed a long-term plan to seismically upgrade the ventilation and fire suppression systems.

Laboratory personnel also refined the analysis of the seismically-induced fire scenario to support the 2011 DSA that was approved by the NNSA's Los Alamos Site Office (LASO) in October 2011 and is in the process of being implemented. The Board's staff identified multiple, substantial deficiencies of a non-conservative nature in this refined analysis, specifically with the technical basis for selection of key input parameters, analytical assumptions, and methodologies. The Board's estimate of this accident's mitigated dose consequence in excess of 100 rem TEDE accounts for conservatism in the leak path factor and respirable fraction for one material. Additional use of appropriately conservative parameters would further increase the dose consequence for this postulated accident. The staff also identified issues with the quality assurance process that was applied to documents and analyses that support the DSA. In

particular, key DSA input documents were not independently reviewed as required by laboratory procedures. The Board has discussed many of these issues with NNSA in its review of previous DSA revisions.

Contractor development and submission of high quality DSA documents in accordance with Title 10 Code of Federal Regulations Part 830, *Nuclear Safety Management*; and thorough and critical review by NNSA, are fundamental elements for ensuring safe operations at defense nuclear facilities. The issues identified above and in the enclosed report require prompt action by NNSA. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a briefing and report, within 30 days of the receipt of this letter, which contain the following:

1. NNSA plans for providing a sound and technically justifiable Safety Basis that includes correction of the non-conservative deficiencies identified in the enclosed report.
2. Necessary actions to ensure that quality assurance requirements are adequately implemented at LANL for Safety Basis development.
3. NNSA actions to ensure Safety Basis review and approval processes are performed with sufficient rigor to prevent technically deficient Safety Bases from being approved.

Sincerely,



Peter S. Winokur, Ph.D.
Chairman

Enclosure

c: Mr. Kevin W. Smith
Mrs. Mari-Jo Campagnone